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EDITORIAL

Themed issue: Optofluidics

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The term optofluidics defines a growing research area that integrates optics and microfluidics in ways that enable unique strengths and advantages for a broad range of applications. The First International Conference on Optofluidics (Optofluidics-2011) organized by Xi'an Jiaotong University and Lab on a Chip on 11–12 December 2011 featured work in this field, with an exciting two-day program of presentations and discussions. We are happy that Lab on a Chip, a major publication destination for optofluidic research, has scheduled this themed issue on Optofluidics. We are especially heartened that the optofluidics community has responded enthusiastically with a large number of excellent manuscript submissions.

This special issue showcases numerous interesting optofluidic research projects and contains a number of comprehensive review articles. The two major optofluidic application areas, optofluidic lasers and optofluidic biosensors, continue to mature in sophistication and application range. We would especially like to draw attention to the intriguing possibilities of using optofluidics to smell as reported in 10.1039/C2LC40489C, and the interesting use of a bio-switchable synthetic reagent to implement a permutable optofluidic laser (10.1039/C2LC40183E).

This last work is further noteworthy as it represents one of the first attempts to integrate synthetic biology with optofluidics. Synthetic biology can be roughly defined as the design and implementation of novel biological systems and processes not found in nature (http://en.wikipedia.org/wiki/Synthetic_biology). Optofluidics is a good match with the needs of synthetic biology as it offers novel tools to chaperone and control the exacting and complex synthesis processes associated with that research area. On the flip-side, synthetic biology offers interesting new light sensitive or reactive compounds that are well-suited for optofluidic integration. 10.1039/C2LC40828G is an excellent forward-looking review that discusses some of the first efforts in this direction, and outlines a number of intriguing avenues for exploration.

Finally, we would like to highlight the new research in applying optofluidics for biofuel production (10.1039/C2LC40490G) as a pioneering effort into another new and intriguing research direction. As the paper shows, optofluidics can bring key advantages to renewable energy research and production.

All of the papers in this special issue were refereed according to the usual Lab on a Chip standards, with Ai-Qun Liu and Changhuei Yang serving as editors. Following the success of the first conference, Optofluidics2012 will be held on 13–15 September 2012 in Suzhou, China (http://www.chinanosz.com/optofluidics2012.aspx).

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